7th September, 2010

Clean Coal Day in Japan 2010

～ Multi-Cooperation between Japan and the Coal producing countries ～

『 New Approach to the Stable Coal-Supply-Chain Society』

ITOCHU CORPORATION

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Challenge in Coal Market and ITOCHU Approach

Challenge	Secure Coal Assets	Establish Stable Coal Supply Chain	Reduce Environmental Load
Background	・Progress of oligopoly ・Aggressive assets acquisition by developing countries	・Deficiency of rail, port, ship ・Rapidly growing domestic demand within coal producing countries	・Negative characteristics of coal (CO_2, Sulfur, Ash) ・Globalization of environmental preservation
Our Function	・Secure coal assets ・Develop new source ・Maintain purchase contracts in the long term basis	・Establish smooth coal transportation chain ・Disperse supply source	・Support on new technology development
Our Approach	・Retain valuable coal assets ・Diversify supply source by the development in new area	・Commit to port and rail capacity expansion ・Establish barge transportation system	・Develop coal up-grade technology ・Engage in low ash / low sulphur coal trade

Secure Coal Assets （1）ITOCHU assets and new sources

In-operation assets

Country	Name of Mine	Equity Ratio	Coal Type	Annual Production Capacity	ITOCHU Equity Coal
Australia	NCA	35.0%	Thermal/Metallurgical	13.5 million tons	4.7 million tons
	Oaky Creek	20.0%	Metallurgical	8.5 million tons	1.7 million tons
	Rolleston	12.5%	Thermal	8.5 million tons	1.1 million tons
	Ashton	10.0%	Metallurgical/Thermal	3.0 million tons	0.3 million tons
Indonesia	MGM	23.5%	Metallurgical/Thermal	1.5 million tons	0.4 million tons

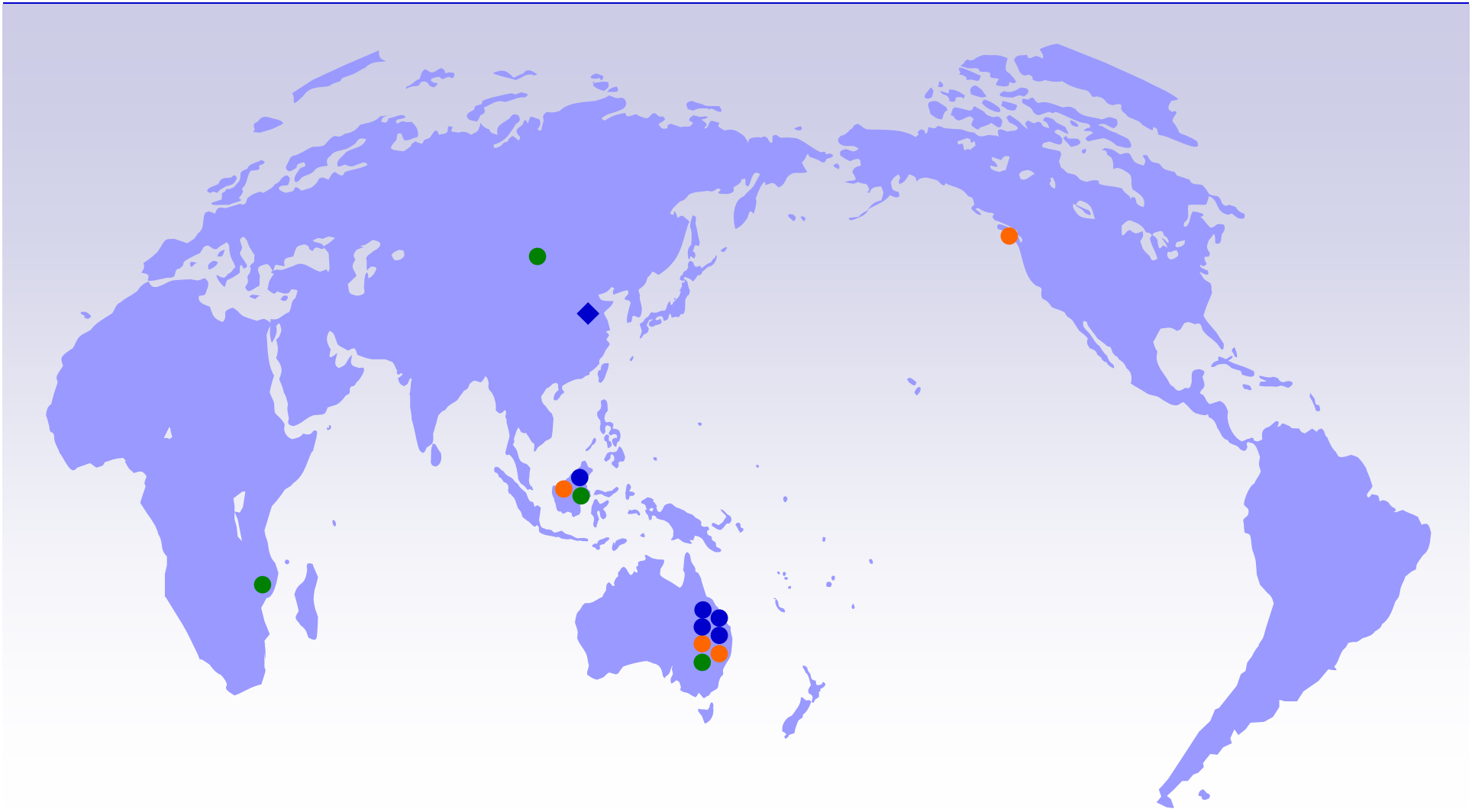
Project assets

Australia	Wandoan	12.5%	Thermal	20.0 million tons	Year 2014 ～
	Ravensworth North	10.0%	Metallurgical/Thermal	10.0 million tons	Year 2012 ～
	Vickery South	49.0%	Metallurgical/Thermal	2.0 million tons	Year 2013 ～
Indonesia	SMM	23.5%	Metallurgical/Thermal	3.0 million tons	Year 2012 ～
Canada	Raven	20.0%	Metallurgical/Thermal	1.5 million tons	Year 2012 ～

New sources

Australia	Maules Creek	High quality thermal coal, 10million tons p.a., Acquired 2.75% share at Aston IPO
Indonesia	Kalimantan, Sumatra	High quality metallurgical/thermal coal, Close-range source to Asia region
Mongolia	Tavan Tolgoi	High quality metallurgical coal, Vast resources, but inadequate infrastructure
Africa	South Africa, Mozambique	High quality metallurgical coal, Vast resources, but inadequate infrastructure

Secure Coal Asset （2）ITOCHU assets and new sources



Establish stable supply chain （1）ITOCHU Approach

Production area (Open Cut coal mine, Underground coal mine)

- Coal mine development
- ROM coal Production
- Coal Preparation
- Storage
- Shipment

Domestic transportation

- Inland transportation
  - Rail
  - Truck
  - Barge

Seaborne transportation

- Storage
- Shipment
- Seaborne transportation

Consuming region (Power plant, Iron mill)

- Storage
- Consumption
  - Electric power
  - Steelmaking
- Coal Effective Utilization Technology

ITOCHU Approach

Australia	Elimination of Infrastructure bottlenecks - Port：Commitment to Abbot Point expansion - Rail：Support on Northern Missing Link construction
	Coal mine ＋ Infrastructure development - Wandoan Coal mine ＋ Rail：Southern Missing Link　Port：Wiggins Island CT
Indonesia	Support on construction of coal transportation system in Central Kalimantan - Barge ＋Intermediate stockpile　- PPP based Railroading for large-scale development
Vietnam	Support on Coal preparation plant construction
Southeast Asia	Support on Coal terminal project

Establish stable supply chain （2）ITOCHU Approach –Case study-

Australia

Wiggins Island CT

Southern Missing Link

Wandoan Coal mine

Mine – Wandoan
- **Operating body：JV**
- **Feasibility Study underway**

Rail – Southern Missing Link
- **Wandoan～Banana（209km）new railroading**
- **Operating body：JV (QR、ATEC、Xstrata)**

Port – Wiggins Island CT
- **Annual capacity：70 million tons in 2020**
- **Newly construct port at north side of Gladstone**

Indonesia

（Central Kalimantan Rail Plan）

（Loading into Barge）

（Intermediate Stockpile）

Establish Barge transportation system at Central Kalimantan

- **Coal shipment stagnates due to low water level at dry-season.**
- **To resolve the issue, Intermediate stockpile between Jetty (shipping port at site) and river-mouth are projected for construcion.**

Central Kalimantan Rail

- **Central Kalimantan Rail project is planned to maintain stable shipment throughout the dry/wet seasons.**
- **PPP based approach is promoted in terms of the construction.**

Reduce Environmental Load （1）Japanese Superior technology

Japanese superior technology contributes to reduce environmental load that coal utilization incur.

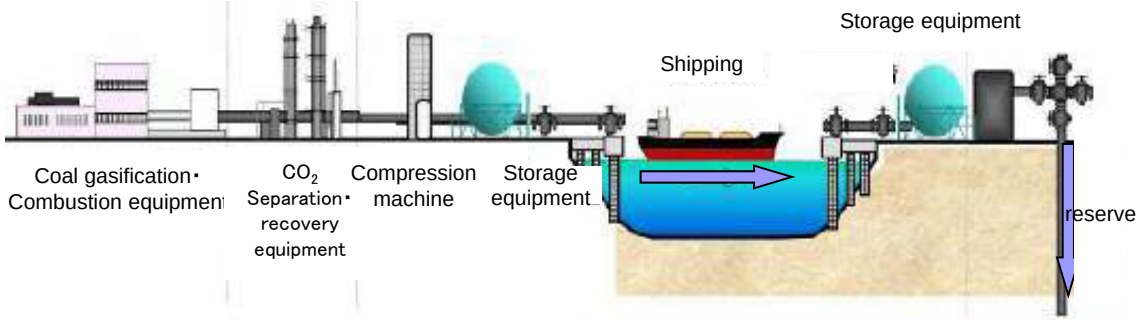
USC and other environmental-friendly technology for power plant

- **Triggered by pollution problem in 1960s and two sets of oil crisis in 1970s, technology for environmental-friendly approach and the development of high-efficiency coal-fired plant have progressed in Japan ahead of the world.**
- **As a result, technologies such as flue-gas desulfurization, denitration, and Ultra Super Critical Power Plant (USC) are developed.**
- **By introducing these technologies to existing power plants both inside and outside the country, vast reduction on the environmental load in world-wide can be achieved.**
- **1.3 billion tons of CO_2 reduction effect is estimated by applying USC to coal-fired plant in USA, China, and India.**

J-POWER Isogo Thermal Power Plant
Photo Credit：J-POWER

IGCC ＋ CCS

- **IGCC realizes high power generation efficiency by using steam and gas both oriented by coal to turn turbines.**
- **IGCC allows to separate CO_2 easily and establishment of technology for Carbon Capture and Storage (CCS) to the ground and/or under the sea is currently under pilot phase.**



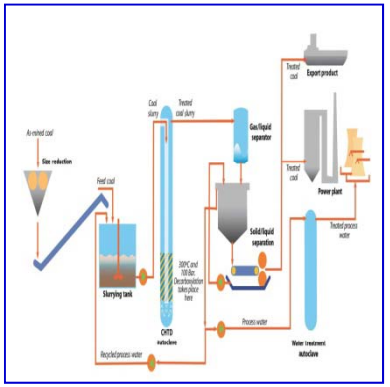
Reduce Environmental Load （2）ITOCHU Approach

ASC

- Artificial Super Coal
- ITOCHU to develop the technology together with the patent holder.
- It is a binder for coke production, made from non-coking property low grade coal such as sub-bituminous coal and brown coal.
- The technology should reduce hard coking coal usage in coke manufacturing process.

CHTD

- Continuous Hydro-Thermal Dewatering.
- ITOCHU invested on Exergen, a company develops the CHTD technology.
- The technology removes inherent moisture by in high temperature, high pressure atmosphere for broadening brown coal utilization.
- It enables to reduce 40% of CO_2 in the power station than using brown coal as it is.



Biomass fuel

- ITOCHU had set up a Joint venture with FELDA Palm to operates biomass fuel manufacturing business.
- It reduces CO_2 by multifuel combustion with coal.
- We are also approaching to biomass fuel utilizing the bagasse (slug of sugarcane) and rice husk.

Low ash/Low sulphur coal trade

- ITOCHU has been focused on the importance of low ash, low sulphur Indonesian coal.
- In January 1996, ITC sold Adaro coal (ash：1.5～2.0%, sulphur：0.1%) to Japanese power utilities for the first time.
- Now 4 million tons p.a. of Adaro coal are imported to Japan.

Approach to the Multi-Cooperation with coal producing countries

Japan

Challenge

- Improve low self-sufficiency ratio of coal : 0.7%
- Increase equity coal position for high consumption
  Consumption : 200 million tons
  Equity Coal : 80 million tons
- Effective utilization of low rank coal
- CO_2 Reduction

Coal producing countries

Challenge

- Beef up supply sources to meet explosive energy demand from emerging countries
- Develop logistic capacity
- Add environmental-friendly value to coal

Japan should provide function and knowledge for

① 『Fund』 (Developing coal mine / infrastructure)
② 『Technology』 (Energy saving・CCT・Coal up-grading)
③ 『Support for Infrastructure construction』 (Including EPC)

to Coal producing countries

Build Win-Win relationship between Japan and the Coal producing countries